Dash® Port Docking Station

Service Manual

2000966-037 Revision B

GE Medical Systems
Information Technologies

gemedicalsystems.com

NOTE: Due to continuing product innovation, specifications in this manual are subject to change without notice.

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1 Introduction

For your notes

Manual Information

Revision History

Each page of this manual has the document part number and revision letter at the bottom of the page. The revision letter identifies the document's update level. The revision history of this document is summarized below.

Table 1. Revision History

Revision	Date	Comment
A	13 February 2001	Initial release of this manual.
B	10 December 2002	Add AUX port communication.

Manual Purpose

This manual supplies technical information for service representatives and technical personnel so they can maintain the equipment to the assembly level. Use it as a guide for maintenance and electrical repairs considered field repairable. Where necessary the manual identifies additional sources of relevant information and technical assistance.

See the operation instructions for the instructions necessary to operate the equipment safely in accordance with its function and intended use.

Intended Audience

This manual is intended for service representatives and technical personnel who maintain, troubleshoot, or repair this equipment.

Safety Information

Responsibility of the Manufacturer

GE is responsible for the effects of safety, reliability, and performance only if:

- Assembly operations, extensions, readjustments, modifications, or repairs are carried out by persons authorized by GE.
- The electrical installation of the relevant room complies with the requirements of the appropriate regulations.
- The equipment is used in accordance with the instructions for use.

General

This device is not intended for home use.

Contact GE for information before connecting any devices to the equipment that are not recommended in this manual.

Parts and accessories used must meet the requirements of the applicable IEC 601 series safety standards, and/or the system configuration must meet the requirements of the IEC 60601-1-1 medical electrical systems standard.

Periodically, and whenever the integrity of the device is in doubt, test all functions.

The use of ACCESSORY equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:

- use of the accessory in the PATIENT VICINITY; and
- evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate IEC 60601-1 and/or IEC 60601-1-1 harmonized national standard.

If the installation of the equipment, in the USA, will use 240V rather than 120V, the source must be a center-tapped, 240V, single-phase circuit.

Warnings, Cautions, and Notes

The terms danger, warning, and caution are used throughout this manual to point out hazards and to designate a degree or level of seriousness. Familiarize yourself with their definitions and significance.

Hazard is defined as a source of potential injury to a person.

Term	Definition
DANGER	Indicates an imminent hazard which, if not avoided, will result in death or serious injury.
WARNING	Indicates a potential hazard or unsafe practice which, if not avoided, could result in death or serious injury.
CAUTION	Indicates a potential hazard or unsafe practice which, if not avoided, could result in minor personal injury or product/property damage.
NOTE	Provides application tips or other useful information to assure that you get the most from your equipment.

Equipment Symbols

ATTENTION: Consult accompanying documents.

equipotential

lock

unlock

Ethernet

4P41

Medical Equipment
With respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1, and CAN/CSA C22.2 NO. 601.1.

Service Information

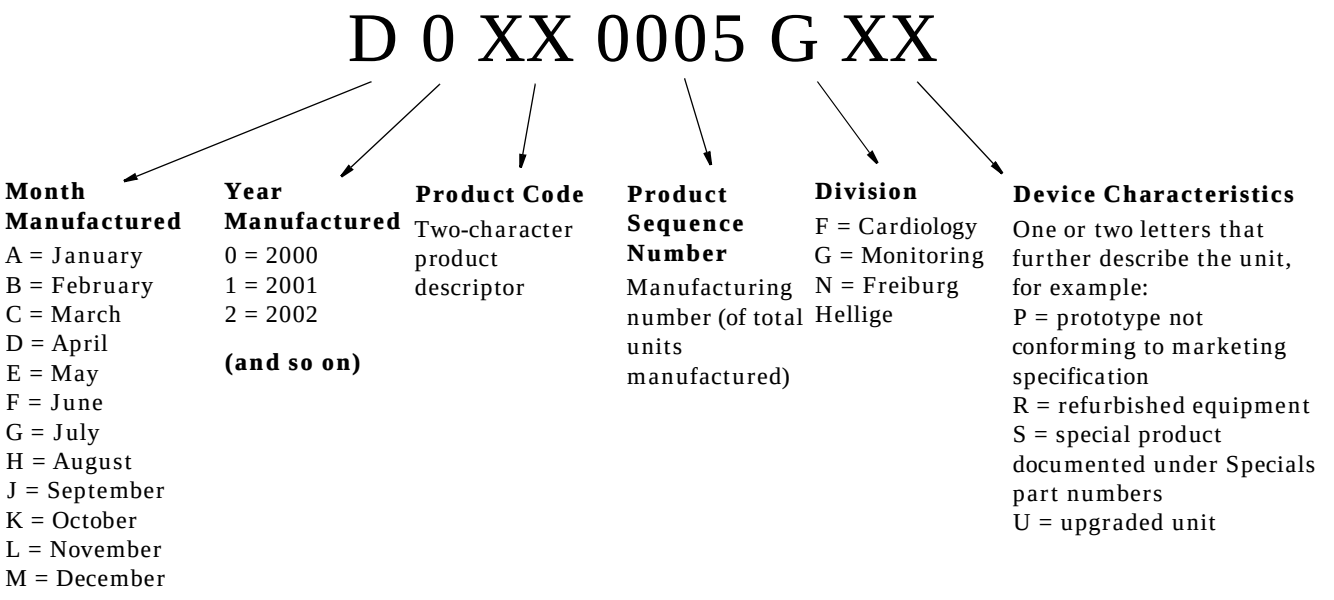
Service Requirements

Follow the service requirements listed below.

- Refer equipment servicing to GE authorized service personnel only.
- Any unauthorized attempt to repair equipment under warranty voids that warranty.
- It is the user's responsibility to report the need for service to GE or to one of their authorized agents.
- Failure on the part of the responsible individual, hospital, or institution using this equipment to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.
- Regular maintenance, irrespective of usage, is essential to ensure that the equipment will always be functional when required.

Equipment Identification

Every GE device has a unique serial number for identification. A sample of the information found on a serial number label is shown below.



2 Equipment Overview

For your notes

The Docking Station

Intended Use

The docking station is a quick mount/dismount base for a Dash patient monitor. It gives the monitor easy connect/disconnect access to AC power, the Unity Network® (Ethernet), and to auxiliary devices.

Dash Monitor Compatibility

NOTE

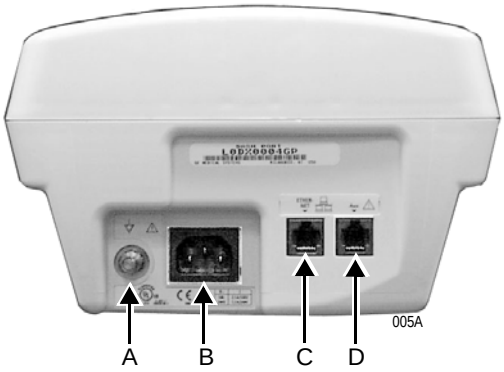
The docking station can be used with ALL Dash monitors. However, some Dash monitors DO NOT support the docking station's Ethernet or auxiliary communication links.

Monitor	AC Power	Ethernet	Auxiliary
Dash 2000 (version 1 and 2 software)	Yes	No	No
Dash 2000 (version 3 or later software)	Yes	Yes	Yes
Dash 3000 (version 1 software)	Yes	Yes	No
Dash 3000/4000 (version 2 software)	Yes	Yes	No
Dash 3000/4000 (version 3 or later software)	Yes	Yes	Yes

Front View

	Name	Description
A	security lever	Slide left to lock the monitor onto the docking station, then slide right to unlock the monitor.
B	AC mains power indicator	Illuminates green when AC power is applied to the docking station.

Back View



	Name	Description
A	equipotential lug	Connect non-grounded peripheral devices to ensure equipotential.
B	AC power connector	Insert AC power cable.
C	**ETHERNET** connector	Connect to the Unity Network.[1]
D	**AUX** connector	Connect to a compatible auxiliary device that is supported by the Dash monitor. In addition, you can use the **AUX** connector on the monitor and on the docking station to connect the following devices. ■ Two RAC 2A module housings to support an ICG module interface with a SAM® module. ■ One RAC 2A module housing and a remote control.

[1] Ethernet communications are prioritized in the following order.

1. Top priority is the docking station interface.
2. Next priority is the hardwired Ethernet connection at the back of the monitor.
3. Lowest priority is the optional Wireless LAN on the monitor.

Installation

WARNINGS

CABLES — Route all cables away from patient's throat to avoid possible strangulation and to prevent interfering with the monitor's attachment to the docking station.

SITE REQUIREMENTS — For safety reasons, all connectors for patient cables and sensor leads are designed to prevent inadvertent disconnection, should someone pull on them. Do not route cables in a way that they may present a stumbling hazard. For devices installed above the patient, adequate precautions must be taken to prevent them from dropping on the patient.

CAUTIONS

PERSONAL INJURY HAZARD — To reduce the potential for orthopedic injury, mount the docking station at a height which prevents overextension of the user's arms when connecting and disconnecting the monitor.

POWER REQUIREMENTS — Before connecting the device to the power line, check that the voltage and frequency ratings of the power line are the same as those indicated on the unit's label. If this is not the case, do not connect the system to the power line until you adjust the unit to match the power source.

In U.S.A., if the installation of this equipment will use 240V rather than 120V, the source must be a center-tapped, 240V, single-phase circuit.

NOTE

The docking station has a standard GCX mounting plate for quick mount/dismount access to GCX mounting devices.

Complete the following to install the docking station.

1. Ensure the wall receptacle is wired correctly.
2. Slide the docking station onto the mounting device's GCX plate. Verify it is secure.
3. Connect the AC power cable to the docking station and to an appropriate AC power source.
4. Insert the Unity MC-Network connector into the **ETHERNET** port of the docking station.
5. Complete the "Electrical Safety Tests" on page 3-6 and the "Checkout Procedures" on page 3-17.

Technical Specifications

Item	Specification
Power Requirements	
without monitor	88-270 VAC RMS, 47-63 HZ Maximum input current is125 mA RMS
with monitor at 115V setting	88-135 VAC RMS, 47-63 HZ
with monitor at 230V setting	176-270 VAC RMS, 47-63 HZ
Power Consumption (fully loaded)	75 W
Operating Conditions	
operating temperature	0 to 50°C (32 to 122°F)
relative humidity, non-condensing	5 to 95% at 40°C (104°F)
altitude	-610 to 4,570 m (-2000 to 15, 000 ft.)
Cooling Method	convection
Storage Conditions	
maximum	70°C (158° F) at 95% relative humidity
minimum	-40°C (104° F) at 85% relative humidity
Physical Specifications	
height	13.9 cm (5.5 in)
width	27 cm (10.5 in)
depth	20 cm (8.0 in)
weight	1.95 kg (4.3 lb.)
maximum load	6.8 kg (15 lb.)
Certification	UL 2601-1 classified UL classified for CAN/CSA C22.2 No. 601.1 IEC 60601-1 and EN 60601-1 certified CE Marking for 93/42/EEC concerning medical devices

3 Maintenance

For your notes

Maintenance Schedule

Manufacturer Recommendations

WARNING
Failure on the part of all responsible individuals, hospitals or institutions, employing the use of this device, to implement the recommended maintenance schedule may cause equipment failure and possible health hazards. The manufacturer does not, in any manner, assume the responsibility for performing the recommended maintenance schedule, unless an Equipment Maintenance Agreement exists. The sole responsibility rests with the individuals, hospitals, or institutions utilizing the device.

To ensure the docking station is always functional when required, qualified service personnel should perform the following regular maintenance.

- **Visual Inspection:** Perform a visual inspection upon receipt of the equipment, every 12 months thereafter, and prior to servicing the unit.
- **Cleaning:** Clean the unit upon receipt of the equipment, every 12 months thereafter, and each time the unit is serviced.
- **Electrical Safety Tests:** Perform safety tests upon receipt of the equipment, every 12 months thereafter, and each time the unit is serviced.
- **Checkout Procedures:** Perform the checkout upon receipt of the equipment, every 12 months thereafter, and each time the unit is serviced.

Visual Inspection

The docking station and it's components should be carefully inspected prior to installation, once every 12 months thereafter, and each time the equipment is serviced.

- Carefully inspect the equipment for physical damage. Do not use the docking station if damage is determined. Refer damaged equipment to qualified service personnel.
- Inspect all external connections for loose connectors or frayed cables. Have any damaged connectors or cables replaced by qualified service personnel.
- Safety labels and inscription on the device are clearly legible.

Cleaning

Cleaning Precautions

Use one of the following approved solutions:

- Cidex solution, or
- Sodium hypochlorite bleach (diluted), or
- Mild soap (diluted)
- Lint-free cloth
- Dust Remover (compressed air)

To avoid damage to the equipment surfaces, *never* use the following cleaning agents:

- organic solvents,
- ammonia based solutions,
- acetone solution,
- alcohol based cleaning agents,
- Betadine solution,
- a wax containing a cleaning substance, or
- abrasive cleaning agents.

Exterior Cleaning

Clean the exterior surfaces with a clean, lint-free cloth and one of the cleaning solutions listed in the table above.

- Wring the excess solution from the cloth. Do not drip any liquid into open vents, switches, plugs, or connectors.
- Dry the surfaces with a clean cloth or paper towel.

Electrical Safety Tests

Recommendations

WARNING
Failure to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards. Unless you have an Equipment Maintenance Contract, GE does not in any manner assume the responsibility for performing the recommended maintenance procedures. The sole responsibility rests with the individual or institution using the equipment. GE service personnel may, at their discretion, follow the procedures provided in this manual as a guide during visits to the equipment site.

GE recommends that you perform electrical safety tests:

- upon receipt of the device.
- every twelve months thereafter, and
- each time the main enclosure is disassembled or a circuit board is removed, tested, repaired, or replaced.

Test Conditions

Electrical safety tests may be performed under normal ambient conditions of temperature, humidity, and pressure.

First complete ALL the electrical safety tests with a Dash monitor connected to the docking station to verify proper operation of the interconnected devices.

Second, complete the following electrical safety tests to verify proper operation of the docking station as a stand-a-lone device:

- “Wall Receptacle Test” on page 3-7.
- “Ground (Earth) Integrity” on page 3-8.
- “Ground (Earth) Wire Leakage Current Tests” on page 3-10.
- “Enclosure Leakage Current Test” on page 3-12

Test Equipment

The manufacturer recommended test equipment required to perform electrical safety tests is listed below. Equivalent equipment may be substituted as necessary.

Required Tools/Special Equipment	
Item	**Part Number**
Leakage Current Tester 120 V (or equivalent) 240 V (or equivalent)	 DALE 600 DALE 600E
Multimeter	–

Wall Receptacle Test

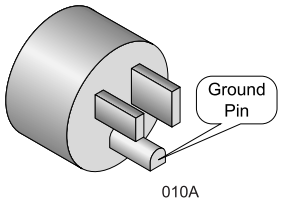
Before starting the tests, the wall receptacle from which the monitoring device will get electrical power must be checked. This test checks the condition of the wall receptacle to ensure correct results from leakage tests.

For international wall receptacles, refer to the internal standards agencies of that particular country. Use a digital multi meter to ensure the wall receptacle is wired properly.

If other than normal polarity and ground is indicated, corrective action must be taken before proceeding. The results of the following tests will be meaningless unless a properly wired wall receptacle is used.

Ground (Earth) Integrity

Listed below are two methods for checking the ground (earth) integrity, “Ground Continuity Test” and “Impedance of Protective Earth Connection.” These tests determine whether the device's exposed metal and power inlet's earth (ground) connection has a power ground fault condition.



Perform the test method below that is required by your Country/Local governing safety organization.

Ground Continuity Test

Completion of this test is checked by the following steps:

1. Disconnect the DUT (device under test) from the wall receptacle.
2. Connect the negative(-) lead of the ohm meter to the protective earth terminal (ground pin in power in-let connector) or the protective earth pin in the MAINS PLUG (ground pin in power cord). Refer to the US 120Vac power cord figure on the left.
3. Set the Ohm meter to the milliohm (mΩ) range.
4. Connect the positive (+) lead of the Ohm meter to all exposed metal surfaces on the DUT. If the metal surfaces are anodized or painted scrape off a small area in a inconspicuous area for the probe to make contact with the metal.
5. Resistance should read to pass:
   - 0.1 ohm or less without power cord
   - 0.2 ohms or less with power cord

Impedance of Protective Earth Connection

This test unlike a ground continuity test will also stress the ground system by using special ground bond testers i.e. Kikusui (model 872 or TOS 6100) or Associated Research model HYAMP® Jr. Model 3030D.

This test normally is only required as a manufacturing production test to receive safety agency compliance (i.e. IEC601-1).

Some country agency's do require this test after field equipment repairs (i.e. Germany's DIN VDE 0751 standards).

Consult your country/local safety agency if in question.

Compliance is checked by the following steps:

1. A current not less than 10A and not exceeding 25A from a current source with a frequency of 50 or 60 Hz with a no-load voltage not exceeding 6 V is passed for at least 5 s through the protective earth terminal or the protective earth pin in the mains plug and each accessible metal part which could become live in case of failure in basic insulation.
2. The voltage drop between the parts described is measured and the impedance determined from the current and voltage drop. It shall not exceed the values indicated.

For equipment without a power supply cord the impedance between the protective earth terminal and any accessible metal part which is protectively earthed shall not exceed 0.1 ohms.

For equipment with a power supply cord the impedance between the protective earth pin in the mains plug and any accessible metal part which is protectively earthed shall not exceed 0.2 ohms.

When taking this measurement move the unit's power cord around, no fluctuations in resistance should be observed.

Ground (Earth) Wire Leakage Current Tests

Perform this test to measure current leakage through the ground (earth) wire of the equipment during normal operation.

1. Set the leakage tester switches as follows:
   - Selector knob - 1,
   - GND switch - OPEN,
   - Polarity switch - NORM,
   - Power switch - OFF.
2. Connect the DMM to the METER jacks on the leakage tester. Set the DMM to measure AC millivolts.
3. Connect the power cord of the device under test to the power receptacle on the rear of the leakage tester.

   NOTE

   The device under test is to be tested at its normal operating voltage.
4. Set the leakage tester power switch to ON.
5. Set the power switch of the device under test to ON.
6. Read the current leakage indicated on DMM. If the reading is greater than the appropriate specification below, the device under test fails and should be repaired and tested again.
   - 300 microamperes (0.3 volts on the DMM), and the device under test is powered from 100-120 V/50-60 Hz
   - 300 µA (0.3 volts on the DMM), and the device under test is powered from a centered-tapped 200-240 V/50-60 Hz, single phase circuit
   - 500 µA (0.5 volts on the DMM), and the device under test is powered from a non-center-tapped, 200-240 V/50-60 Hz, single-phase circuit.

   NOTE

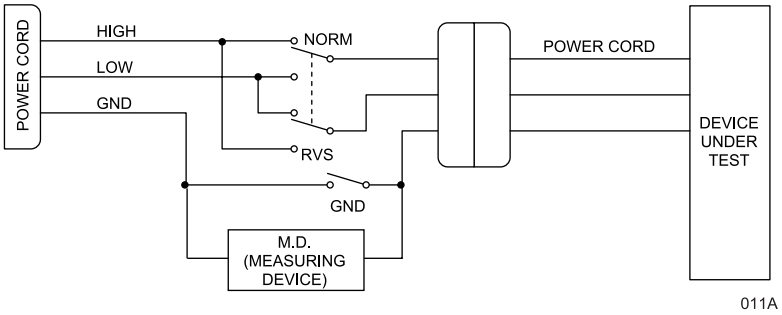
   Center-tapped and non-center-tapped circuits produce different leakage currents and the UL and IEC limits are different.
7. Set the polarity switch on the leakage tester to RVS (reverse).
8. Read the current leakage indicated on DMM. If the reading is greater than the appropriate specification below, the device under test fails and should be repaired and tested again.
   - 300 microamperes (0.3 volts on the DMM), and the device under test is powered from 100-120 V/50-60 Hz
   - 300 µA (0.3 volts on the DMM), and the device under test is powered from a centered-tapped 200-240 V/50-60 Hz, single phase circuit
   - 500 µA (0.5 volts on the DMM), and the device under test is powered from a non-center-tapped, 200-240 V/50-60 Hz, single-phase circuit

NOTE

Center-tapped and non-center-tapped circuits produce different leakage currents and the UL and IEC limits are different.

9. Set the leakage tester power switch to OFF.

LEAKAGE TESTER
PARTIAL SCHEMATIC



NOTE

The MD (measuring device) is the circuitry defined by the appropriate standard for measuring leakage current.

NOTE

The measuring devices, defined by various standard organizations (IEC, UL, etc.), produce almost identical test measurement results.

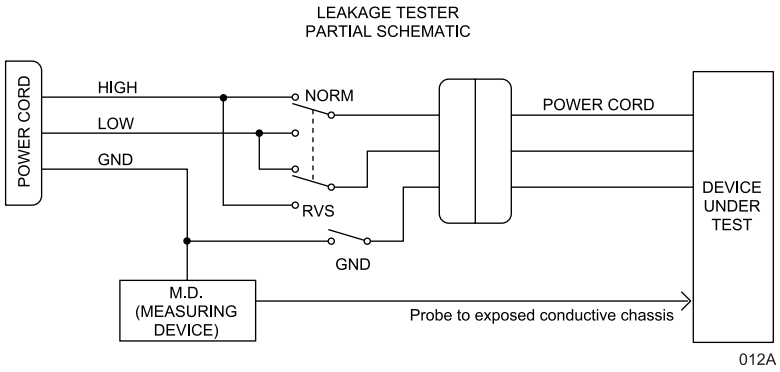
Enclosure Leakage Current Test

Perform this test to measure current leakage through exposed conductive surfaces on the device under test during normal operation.

1. Set the leakage tester switches as follows:
   - Selector knob - 2,
   - GND switch - OPEN, and
   - Polarity switch - NORM.
2. Connect a meter lead between the CHAS connector on the rear of the leakage tester and an unpainted, non-anodized chassis ground on the unit under test.
3. Set the leakage tester power switch to ON.
4. Read the current leakage indicated on DMM. If the reading is greater than the appropriate specification below, the device under test fails and should be repaired and tested again.
   - 300 microamperes (0.3 volts on the DMM), and the device under test is powered from 100-120 V/50-60 Hz
   - 300 µA (0.3 volts on the DMM), and the device under test is powered from a centered-tapped 200-240 V/50-60 Hz, single phase circuit
   - 500 µA (0.5 volts on the DMM), and the device under test is powered from a non-center-tapped, 200-240 V/50-60 Hz, single-phase circuit

   NOTE
   Center-tapped and non-center-tapped circuits produce different leakage currents and the UL and IEC limits are different.
5. Set the polarity switch to RVS and observe the same meter readings as in the previous step.
6. Set the GND switch on the leakage tester to CLOSED.
7. Read the current leakage indicated on DMM. If the reading is greater than the appropriate specification below, and the device under test is powered from 100-240 V/50-60 Hz, the device under test fails and should be repaired and tested again.
   - 100 microamperes (0.1 volts on the DMM), and the device under test is powered from 100-240 V/50-60 Hz

8. Set the polarity switch to RVS and observe the same meter readings as in the previous step.
9. Set the leakage tester power switch to OFF and remove the meter lead connected in step 2.



Patient (Source) Leakage Current Test

NOTE
Connect a Dash monitor to the docking station to complete this test.

Test Equipment

Equipment required to perform these tests is listed below. Equivalent equipment may be substituted as necessary.

Name	Manufacturer	Part Number
ECG Test Body	GE Medical Systems *Information Technologies*	MT-3387
Temp/CO Test Body	GE Medical Systems *Information Technologies*	MT-3644

This procedure only applies to Class I (grounded/earthed) equipment, and measures the leakage current from the ECG and TEMP/CO connectors of the device to ground.

1. Set leakage tester switches as follows:
   - Selector knob – 3,
   - GND switch – GND OPEN,
   - Polarity switch – NORM,
   - Power switch – OFF.
2. Connect an ECG test body to the ECG connector of the DUT.
3. Connect a short length of cable between the ECG test body installed in the last step and the jacks on the top of the leakage tester.
4. Set the leakage tester power switch to ON.
5. Set the rear panel power switch of the device to ON.

6. Read the leakage current indicated on the DMM.

   If the reading is greater than 50 µA (0.05 volts on the DMM), the device under test fails this test and should be repaired and tested again.

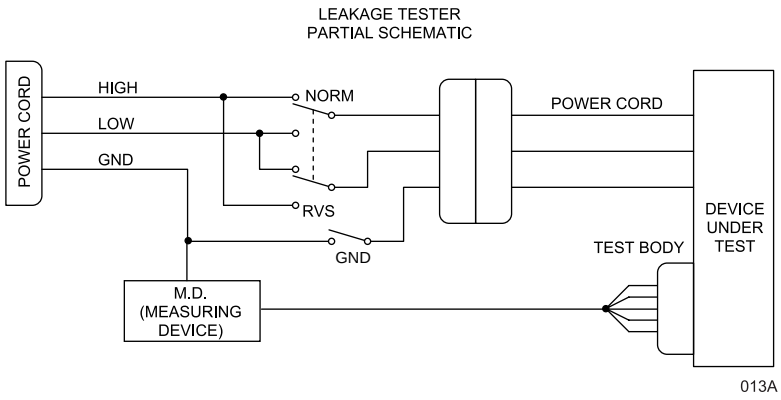
   NOTE
   The AAMI and IEC single fault condition (ground open) is 50 µA, whereas the normal condition (ground closed) is less.

7. Change the leakage tester polarity switch to the RVS position.
8. Read the leakage current indicated on the DMM.

   If the reading is greater than 50 µA (0.05 volts on the DMM), the device under test fails this test and should be repaired and tested again.

   NOTE
   The AAMI and IEC single fault condition (ground open) is 50 µA, whereas the normal condition (ground closed) is less.

9. Change the GND switch to the CLOSED position.



10. Read the leakage current indicated on the DMM.
11. If the reading is greater than 10 µA (0.01 volts on the DMM), the device under test fails this test and should be repaired and tested again.
12. Change the leakage current switch to the RVS position.
13. Read the leakage current indicated on the DMM.
14. If the reading is greater than 10 µA (0.01 volts on the DMM), the device under test fails this test and should be repaired and tested again.
15. Set the power switch of the leakage tester to OFF.
16. Repeat all previous steps for the TEMP/CO connector using the appropriate test body.

Patient (Sink) Leakage Current Test (Mains Voltage on the Applied Part)

NOTE
Connect a Dash monitor to the docking station to complete this test.

This procedure only applies to Class I (grounded/earthed) equipment, and measures the leakage current from a mains voltage source into the ECG and TEMP/CO connectors.

1. Set the leakage tester switches as follows:
   - Selector knob – 5,
   - GND switch – CLOSED,
   - Polarity switch – NORM.

2. Disconnect the test cable from the leakage tester PATIENT JACKS (TOP) and reconnect it to the PATN JACK connector on the front panel of the leakage tester.

WARNING
The following step will cause high voltage (120 VAC to 240 VAC) to appear at the PATN JACK on the leakage tester. **Do not** touch the PATN JACK posts or ECG lead clips during this test as an electrical shock will occur.

3. Set power switch on the leakage tester to ON.
4. Read leakage current indicated on DMM.

   If the reading is greater than the appropriate specification below, the device under test fails this test and should be repaired and tested again.

   - 10 µA, (0.01 volts on the DMM) at 120 VAC without the patient cable.
   - 20 µA (0.02 volts on the DMM) at 240 VAC without the patient cable.
   - The 10 and 20 µA limit are based on internal design standards.
   - 50 µA (0.05 volts on the DMM) at 120-240 VAC with the patient cable.

   NOTE
   The 50 µA limit is common to all standards. AAMI ES-1 standard requires using the patient cable.

5. Change the leakage tester polarity switch to the RVS position.

6. Read the leakage current indicated on the DMM.

   If the reading is greater than the appropriate specification below, the device under test fails this test and should be repaired and tested again.

   - 10 µA (0.01 volts on the DMM) at 120 VAC without the patient cable.
   - 20 µA (0.02 volts on the DMM) at 240 VAC without the patient cable.

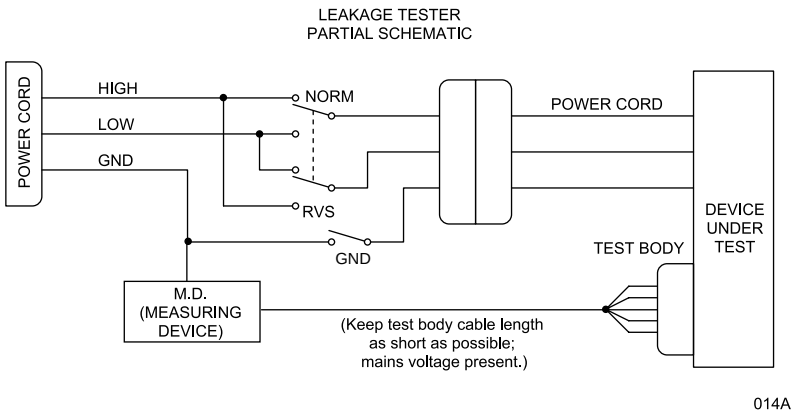
     NOTE

     The 10 and 20 µA limits are based on internal design standards.

   - 50 µA (0.05 volts on the DMM) at 120-240 VAC with the patient cable.

     NOTE

     The 50 µA limit is common to all standards. AAMI ES-1 standard requires using the patient cable.



7. Set the power switch on the leakage tester to OFF.
8. Repeat all previous steps for the TEMP/CO connector using the appropriate test body.

Test Completion

Disconnect all test equipment from the device. Disconnect the device power cord plug from the leakage tester power receptacle. Disconnect the leakage tester from the wall receptacle.

Checkout Procedures

Recommendations

NOTE
Complete the checkout procedures with a Dash monitor connected to the docking station.

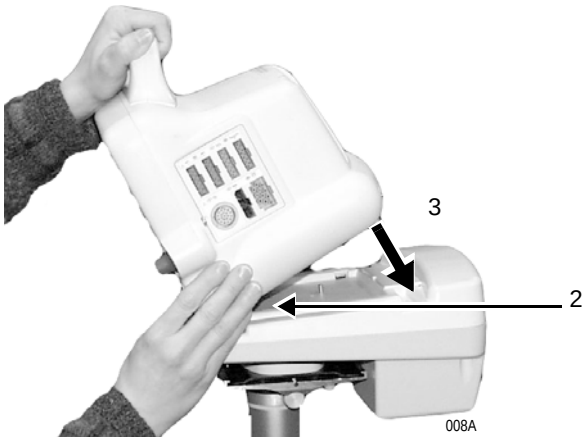
GE recommends that you perform checkout procedures:

- upon receipt of the device.
- every twelve months thereafter, and
- each time the main enclosure is disassembled or a circuit board is removed, tested, repaired, or replaced.

Verify Correct Docking Station Operation

To troubleshoot operation problems, see Chapter 4, "Troubleshooting".

Verify the Monitor is Secured to the Docking Station



1. Verify the docking station's security lever starts in the unlock (far right) position.
2. Position the front of the Dash monitor onto the front channel of the docking station.
3. Hold onto the monitor and allow the weight of the monitor to descend firmly onto the docking station. The security lever should move to the central position.
4. Try to pivot the monitor from front to back to verify it is secure.

Verify the AC power and Communication Links

1. Slide the security lever to the far left position.
2. Complete the "Docking Station Power-up Tests" and the "Network Test" starting on page 3-18.

Docking Station Power-up Tests

1. Verify that a monitor is connected to the docking station.
2. Verify the docking station's security lever is in the far left position.
3. Remove the batteries from the monitor and unplug the docking station from AC power to turn the monitor off.
4. Restore the batteries to the monitor and plug the docking station into AC power to turn the monitor on.
5. Verify all the monitor's front panel indicators illuminate on power up.
6. Verify the AC indicator on the monitor stays illuminated.

NOTE

If the AC LED stays on, but the screen is blank, the monitor is likely in "standby mode" (battery charging). Press the **Power** button to turn on the monitor.

Network Test

NOTE

Some Dash monitors do not support the docking station's Ethernet or auxiliary communication links. See "Dash Monitor Compatibility" on page 2-3.

1. Verify that a monitor is connected to the docking station.
2. Verify the docking station's security lever is in the far left position.
3. Verify that the docking station (not the monitor) is connected to the Unity-MC (Mission Critical) network.
4. Select *VIEW OTHER PATIENTS*.
5. Select *SELECT ANOTHER CARE UNIT*.
6. Verify that you can see at least one care unit.
7. Select a care unit.
8. Select *SELECT A BED TO VIEW*.
9. Select a bed.
10. Verify that the patient window appears on the monitor's split-screen.

For your notes

4 Troubleshooting

For your notes

Visual Inspection

A thorough visual inspection of the equipment may help identify the problem.

Area to Inspect	Problems
I/O connectors and cables	■ frayed cables or other damage ■ bent prongs or pins ■ cracked housing ■ loose screws
interface cables	■ excessive tension or wear ■ loose connection ■ strain reliefs out of place
circuit boards	■ moisture, dusts, or debris (top and bottom) ■ looser or missing components ■ burn damage or smell of over-heated components ■ PCB not seated properly in edge connectors
ground wires/wiring	■ loose wires or ground strap connections ■ faulty wiring ■ pinched wires
mounting hardware	■ loose or missing screws or other hardware
power source	■ faulty wiring of power source ■ circuit not dedicated to system could cause static discharge.

Power Cable and Plug

Verify the power cable used with the equipment is good.

Problem	Cause	Solution
■ tripped circuit breakers ■ blown fuses. ■ AC power indicator is not illuminated monitor will not switch from battery power to AC power.	plug wires are loose	■ Verify that the line, neutral, and ground wires are firmly connected to the plug and are not short-circuited. ■ Replace the power cable if necessary.

General

Problem	Cause	Solution
The security lever is already in the central position BEFORE the monitor has been placed on the docking station.	The locking mechanism may have been accidentally activated before the monitor was placed on the docking station.	Remove the monitor. Try to re-set the docking station's locking mechanism by moving the security lever to the unlock (far right) position.
	The locking mechanism has failed.	Replace the top housing. 1. Review the "Disassembly Guidelines" on page 5-3. 2. Complete, "Separating the Top and Bottom Housings" on page 5-4. 3. Throw away the failed top housing and complete, "Joining the Top and Bottom Housings" on page 5-6. 4. Complete, "After Reassembly" on page 5-3.
The security lever doesn't move to the central position when the monitor has been placed on the docking station.	The monitor's footpad and/or GCX plate may have been removed. Without both components, the monitor WILL NOT safely or correctly function with the docking station.	Replace the missing footpad and/or GCX plate.
	Cables or other objects may be preventing the monitor from activating the locking mechanism.	Ensure the docking station's base is free of objects.
	The monitor might not be positioned correctly on the docking station to activate the locking mechanism.	Remove and re-position the monitor.
	The locking mechanism has failed.	Remove the monitor from the docking station. Try to manually depress the locking lever pin. If it doesn't depress, replace the top housing. 1. Review the "Disassembly Guidelines" on page 5-3. 2. Complete, "Separating the Top and Bottom Housings" on page 5-4. 3. Throw away the failed top housing and complete, "Joining the Top and Bottom Housings" on page 5-6. 4. Complete, "After Reassembly" on page 5-3.

Problem	Cause	Solution
The monitor pivots when the security lever is in the lock position.	The docking station's locking mechanism may have been accidentally activated before the monitor was placed on the docking station.	Remove the monitor and try to re-set the locking mechanism by moving the security lever to the unlock (far right) position.
	The monitor might not be positioned correctly on the docking station to allow all four clamps to secure the monitor's GCX plate.	Remove and re-position the monitor on the docking station. Verify the monitor doesn't pivot.
	The locking mechanism has failed.	Remove the monitor from the docking station. Manually depress the locking lever pin and verify the four clamps extend out from the base of the docking station. If they don't extend, replace the top housing. 1. Review the "Disassembly Guidelines" on page 5-3. 2. Complete, "Separating the Top and Bottom Housings" on page 5-4. 3. Throw away the failed top housing and complete, "Joining the Top and Bottom Housings" on page 5-6. 4. Complete, "After Reassembly" on page 5-3.
The docking station will not release the monitor when the security lever is moved to the unlock position.	The security lever was not moved and held in the unlock position while the monitor was removed.	Slide and hold the security lever in the unlock (far right) position until you remove the monitor from the docking station.
	The locking mechanism has failed.	1. Remove the six screws from the bottom of the docking station to separate the top housing of the docking station from the bottom housing of the docking station. 2. Use a bladed screw driver to manually release the docking station's clamps from the base of the monitor. 3. If necessary, contact Technical Support. 4. Replace the top housing. ■ Review the "Disassembly Guidelines" on page 5-3. ■ Complete, "Separating the Top and Bottom Housings" on page 5-4. ■ Throw away the failed top housing and complete, "Joining the Top and Bottom Housings" on page 5-6. ■ Complete, "After Reassembly" on page 5-3.

Problem	Cause	Solution
The security lever doesn't move to the far left position.	Cables or other objects may be blocking the monitor's AC power or communication ports.	Remove the monitor from the docking station and remove any cables or other objects from the connector ports located on the bottom of the monitor.
	The monitor's expansion pcb may be damaged.	Replace the monitor's damaged expansion pcb. See the appropriate Dash Patient Monitor's Service Manual.
	The monitor may not be positioned correctly on the docking station.	Remove and reposition the monitor.
	Foreign objects may be blocking the monitor's expansion pcb.	Remove foreign objects blocking the expansion PCB.
	The AC power/communication mechanism has failed.	Remove the monitor from the docking station. Manually depress the locking lever pin and slide the security lever to the far left position. The AC power/communication mechanism should extend out of the docking station's base and lock into position. If it doesn't, complete the following tasks. 1. Verify the plunger meets the force specifications identified on page 2 of the "Exploded View PN 2004740-001, Revision D" 2. Complete, "Replacing the Connector Assembly or the Bottom Housing" on page 5-5.

Problem	Cause	Solution
The monitor's **Battery** power indicator remains illuminated and the **AC** power indicator WILL NOT illuminate.	The security lever may not be in the far left position.	Slide the security lever to the far left position.
	Cables or other objects may be blocking the monitor's AC power port.	Remove the monitor from the docking station and remove any cables or other objects from the AC connector port located on the bottom of the monitor.
	The docking station may not be connected to an AC power source.	Connect the docking station to an AC power source.
	Internal wiring may be loose	Check for loose connections.
	The monitor may have malfunctioned.	Connect the monitor to AC power to determine if the monitor is the cause. See the appropriate Dash Patient Monitor Service Manual for troubleshooting tips.
	The AC power/communication mechanism has failed.	Remove the monitor from the docking station. Manually depress the locking lever pin and slide the security lever to the far left position. The AC power/communication mechanism should extend out of the docking station's base and lock into position. If it doesn't, or if it appears that power is not being passed to the monitor, complete the following tasks. 1. Verify the plunger meets the force specifications identified on page 2 of the "Exploded View PN 2004740-001, Revision D" 2. Complete, "Replacing the Connector Assembly or the Bottom Housing" on page 5-5.

Problem	Cause	Solution
The monitor is NOT communicating with the Unity MC Network or auxiliary devices.	The security lever may not be in the far left position.	Slide the security lever to the far left position.
	The docking station may not be connected to the network or to the auxiliary devices.	Connect the docking station to the network or to the auxiliary devices.
	The network or auxiliary devices are connected to the monitor instead of the docking station.	Disconnect the network or auxiliary devices from the monitor and connect them to the docking station.
	The connector is inserted into the wrong communication port.	Reposition the connector into the correct port.
	Dirt or other objects are obstructing the connector port.	Remove the obstructions.
	The Dash 2000 monitor may not have the expansion PCB required to interface with the docking station.	Use a Dash 2000 monitor that has the communication PCB installed.See "Dash Monitor Compatibility" on page 2-3. 006A monitor with the expansion PCB
	The AC power/communication mechanism has failed.	Remove the monitor from the docking station and complete the following tasks. 1. Verify the plunger meets the force specifications identified on page 2 of the "Exploded View PN 2004740-001, Revision D" 2. Complete, "Replacing the Connector Assembly or the Bottom Housing" on page 5-5.

For your notes

5 Field Replaceable Units

For your notes

Disassembly Guidelines

Tools Required

A standard set of hand tools is required for disassembly and assembly.

Before Disassembly

Before you disassemble the docking station, you should ALWAYS remove AC power.

Hardware Assemblies

When disassembling the docking station, observe the following guidelines:

- Provide appropriate electrostatic discharge protection and handle all PCB assemblies by their edges to prevent damaging the PCB.
- Note the positions of wires, cables, and different sized screws; marking them if necessary to ensure they are replaced correctly.
- Save and set aside all hardware for re-assembly.

After Reassembly

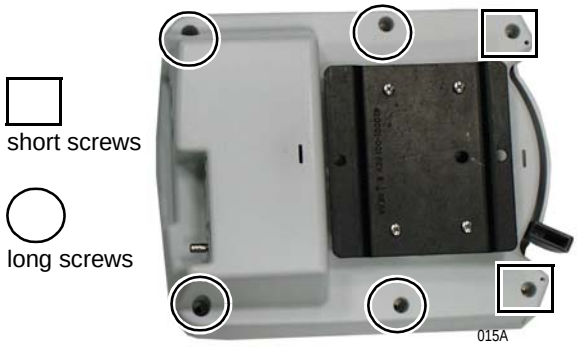
After reassembling the docking station, ALWAYS complete ALL of the checkout procedures, electrical safety tests, and regular maintenance procedures identified and described in this service manual.

Recommended Electrical Safety Tests and Checkout Procedures

Replacement Procedure	Electrical Safety Tests	Checkout Procedures
Locking Assembly Top Housing Connector Assembly Bottom Housing	■ "Wall Receptacle Test" on page 3-7. ■ "Ground (Earth) Integrity" on page 3-8. ■ "Ground (Earth) Wire Leakage Current Tests" on page 3-10. ■ "Enclosure Leakage Current Test" on page 3-12.	■ "Verify Correct Docking Station Operation" on page 3-17. ■ "Docking Station Power-up Tests" on page 3-18. ■ "Network Test" on page 3-19.

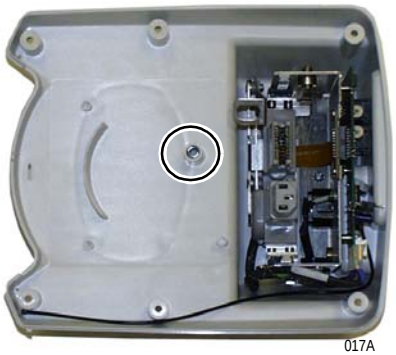
Docking Station Assembly

Separating the Top and Bottom Housings



1. Remove the six screws from the bottom housing.
2. Hold onto both housings and turn the unit over.

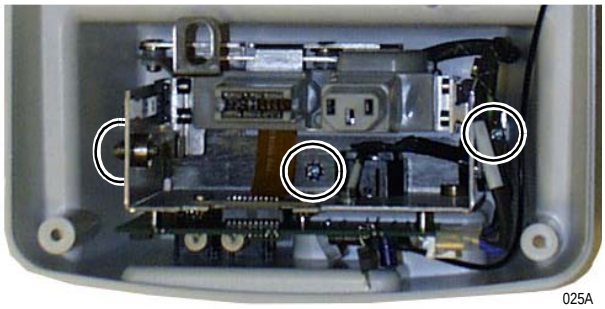
3. Slide and hold the security lever in the far right position while separating the top and bottom housings.
4. Continue to hold onto the security lever and gently let it slide back into its resting position.



5. Remove the locking lever spring and pin.

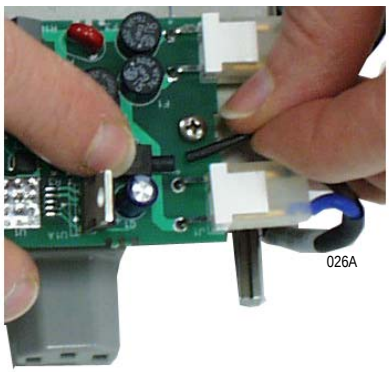
Replacing the Connector Assembly or the Bottom Housing

1. Separate the top and bottom housings.
2. Use a 10 mm wrench or nut driver to remove the equipotential lug.



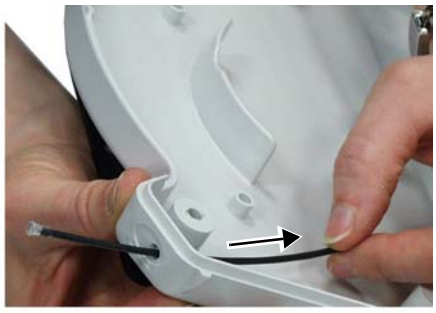
025A

3. Remove the three PCB bracket screws.
4. Lift out the connector assembly.



026A

5. Stabilize the LED component and gently pull out the light pipe from the PCB.



027A

DAMAGED HOUSING NOTE

If you are replacing the bottom housing, you must install the light pipe into the new housing.

- Route the light pipe through the opening into the housing and snap it into place.
- See "Exploded View PN 2004740-001, Revision D" on page 6-3 to apply the labels to the housing.

6. Stabilize the LED component and gently insert the light pipe into the LED component.

028A

7. Route the light pipe as shown to prevent the light pipe from pulling out of the LED connector.
8. Position the connector assembly into the bottom housing.
9. Start with the center screw and install the three PCB bracket screws.
10. Replace the equipotential lug.
11. Join the top and bottom housings. See page 5-6.

Joining the Top and Bottom Housings

017A

1. Insert the locking lever spring into the spring opening.

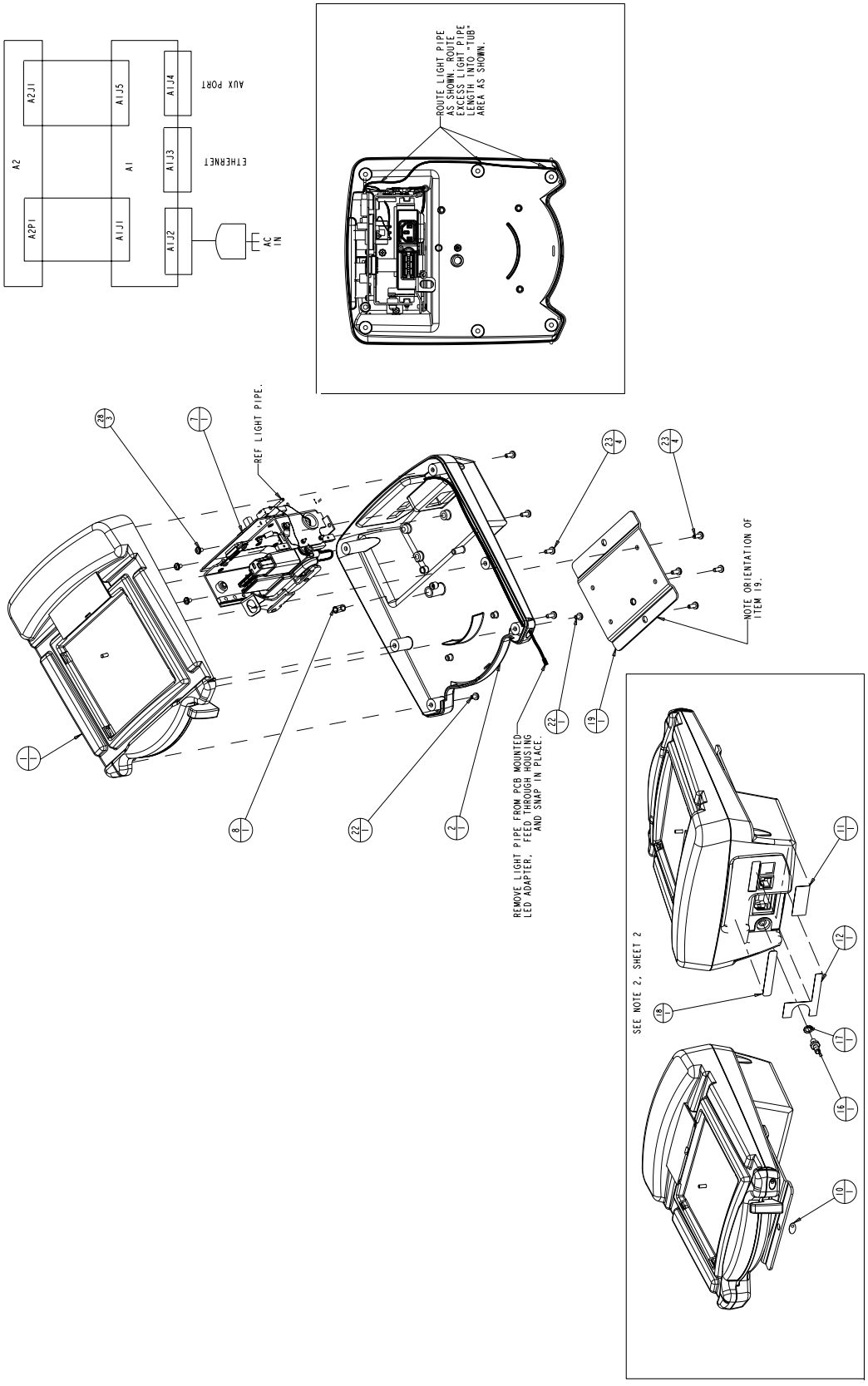
029A

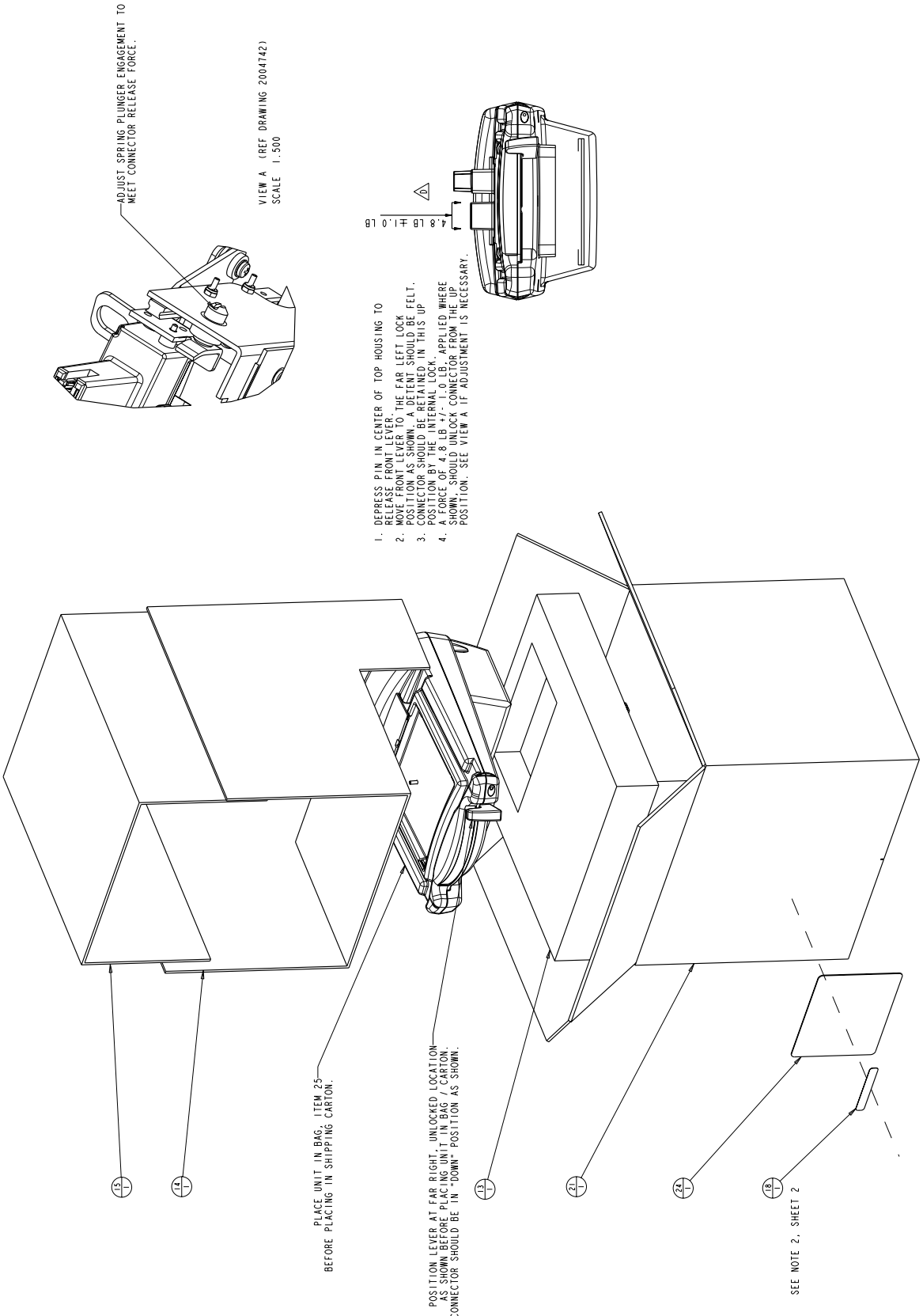
2. Slide and hold the security lever in the unlock position (far left) while inserting the locking lever pin into the locking assembly.
3. Release the security lever and place the top and bottom housing pieces together.
4. Hold onto both housings and turn the unit over and install the six screws.
5. See "After Reassembly" on page 5-3 to identify the electrical safety tests and checkout procedures you must complete.

6 Drawing and Part List

For your notes

Exploded View PN 2004740-001, Revision D




ADJUST SPRING PLUNGER ENGAGEMENT TO MEET CONNECTOR RELEASE FORCE.
VIEW A (REF DRAWING 2004742)
SCALE 1.500
4.8 LB ±1.0 LB
D
1. DEPRESS PIN IN CENTER OF TOP HOUSING TO RELEASE FRONT LEVER.
2. MOVE FRONT LEVER TO THE FAR LEFT LOCK POSITION AS SHOWN. A DETENT SHOULD BE FELT.
3. CONNECTOR SHOULD BE RETAINED IN THIS UP POSITION BY THE INTERNAL LOCK.
4. A FORCE OF 4.8 LB +/- 1.0 LB, APPLIED WHERE SHOWN, SHOULD UNLOCK CONNECTOR FROM THE UP POSITION. SEE VIEW A IF ADJUSTMENT IS NECESSARY.
PLACE UNIT IN BAG, ITEM 25 BEFORE PLACING IN SHIPPING CARTON.
POSITION LEVER AT FAR RIGHT, UNLOCKED LOCATION AS SHOWN BEFORE PLACING UNIT IN BAG / CARTON. CONNECTOR SHOULD BE IN "DOWN" POSITION AS SHOWN.
SEE NOTE 2, SHEET 2
15 1
14 1
13 1
21 1
24 1
18 1

Parts List PN 2004740-001, Rev. B

NOTE

Individual top housing items (screw, pin lock lever, etc.) cannot be ordered separately. You must order the Field Replaceable Unit (FRU), PN 2012306-001. This Field Replaceable Unit is the complete top housing assembly.

Find Num	Item Number	Item Description	Qty
1	2012306-001	TOP HOUSING FIELD REPLACEABLE UNIT	1
2	2002898-002	ENCL BOTTOM DOCKING STATION	1
4	2002958-001	PIN LOCK LEVER	1
7	2004742-001	ASSY CONNECTOR DOCKING STATION	1
8	2004826-001	SPRING CPRSN 7.6 OD X 14.2 LG	1
10	2004852-001	LABEL DASH PORT POWER	0
11	2004853-001	LABEL DASH PORT CONN	0
12	2004854-001	LABEL DASH PORT RATINGS	0
16	400040-001	PLUG MC EQUIPOTENTIAL	1
17	400041-001	WASHER LOCK SERRATED F/M-6	1
18	404525-006	LABEL BLANK 2.6IN X.4IN	1
19	420001-001	PLATE MOUNT GCX DASH	1
28	411061-002	SCR PH M4X .7X6.0LG SEMS	3

For your notes

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